

MARKED-UP VERSION OF ABSTRACT

[Electrode active materials comprising lithium or other alkali metals, a transition metal, a phosphate or similar moiety, and a halogen or hydroxyl moiety. The electrode actives include those of the formula:] The present invention relates to novel electrode active materials represented by the general formula A_aM_b(XY₄)_cZ_d, wherein:

- (a) A is [selected from the group consisting of Li, Na, K, and mixtures thereof] one or more alkali metals, and $0 < a \leq [8]$ 6;
- (b) M [comprises one or more metals, comprising] is at least one metal [which is] capable of undergoing oxidation to a higher valence state, and $1 \leq b \leq 3$;
- (c) XY₄ is selected from the group consisting of X'O_{4-x}Y'_x, X'O_{4-y}Y'_{2y}, X"S₄, [or] and a mixture thereof, where X' is P, As, Sb, Si, Ge, S, [or a mixture thereof] and mixtures thereof; X" is P, As, Sb, Si, Ge, [or a mixture thereof] and mixtures thereof, [; Y' is halogen, $0 \leq x < 3$, $0 < y < 4$, $0 < c \leq 3$; and
- (d) Z is OH, a halogen, or mixtures thereof, and $0 < d \leq 6$, [; and wherein M, X, Y, Z, a, b, c, d, x and y are selected so as to maintain electroneutrality of said compound.

In a preferred embodiment, M comprises two or more transition metals from Groups 4 to 11 of the Periodic Table. In another embodiment, M comprises M'_{1-m}M"_m, where M' is at least one transition metal from Groups 4 to 11 of the Periodic Table; M" is at least one element from Groups 2, 3, 12, 13 or 14 of the Periodic Table, and $0 < m < 1$. Preferred embodiments include those having where c = 1, those where c = 2, and those where c = 3. Preferred embodiments include those where a ≤ 1 and c = 1, those where a = 2 and c = 1, and those where a ≤ 3 and c = 3. This invention also provides electrodes comprising an electrode active material of this

invention, and batteries that comprise a first electrode having an electrode active material of this invention; a second electrode having a compatible active material; and an electrolyte.]